Braille Map Requirements: A Survey of Braille Map Needs and of Problems in Their Fulfillment

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BRAILLE MAP REQUIREMENTS: A SURVEY OF BRAILLE MAP NEEDS AND PROBLEMS IN THEIR FULFILLMENT.

Introduction:

Maps serve as primary sources of information in the study of geography, history and social science. In the past, attempts have been made to use carved and molded maps to present some of this information to the blind. Because of problems associated with media, size and symbolism, the total amount of information presented to the blind through the means of maps has been small.

Developments in the use of plastics, particularly through vacuum forming, have raised the possibility of a whole new range of apparatus for use in the education of blind children. The implications of these developments for map manufacture are several. Maps may become less expensive. A greater number of geographical areas may be represented. In addition, more of the types of information normally presented through maps may be available to blind students.

The purpose of this study to identify the kinds of maps needed and the types of information to be presented. In addition, approaches to the solution of the map problem are explored.

Procedure:

Maps were surveyed in 49 Braille textbooks covering the subjects of history, geography and social studies. These books comprised the total population of Braille books in these subjects available from the American Printing House at the time of the study.

Each map was catalogued by geographical region and the type of information presented. Geographically, maps were classified into the categories of world, hemisphere, continent, country and region. Any regional map was classified under the lowest category possible. For example, a map of the Mediterranean area would be classified as a regional map under Eastern Hemisphere, since it extends beyond either continental Europe or Africa, but is contained within the limits of the Eastern Hemisphere. Maps of localities, such as cities, were omitted from the tabulations.

The geographical categories used are listed in Table I, as are the type of information categories. The latter are more clearly defined in Appendix A. While definition of categories and assignment of maps to them was somewhat arbitrary in some cases, it is believed that the system utilized is reliable enough for the purposes of this study.

TABLE 1. MAPS APPEARING IN CURRENT BRAILLE TEXTS IN GEOGRAPHY, SOCIAL STUDIES, HISTORY (49 texts)

	Political & Physical	Political	Physical	Rainfall	Population	Agriculture Crops	Agriculture Animals	Transportation & Trade Routes	Minerals	Manufacturing Commerce	Vegetation & Land Use	Climate	Irrigation Reclamation	Historical	Fishing	Total
WORLD	3	36	10	1	8	30	3	21	9	2	5	24		43	5	203
Western Hemisphere		17	10	2	4	1		12	1	1	1	4		17	1	71
Mid. Amer.-W. Indies	6	13	2	2	1			2	1					1		28
Cent. & S. Amer., Mex.	1	1						2		1				2		7
N. & Cent. Amer.			1													1
Eastern Hemisphere	3	20	8	4	5	11	3	3				2		8		57
Mediterranean Area	1	4	2	2		6						3		16		34
Near East	3	5	2	1				1	3					14		29
Eurasia	2	1	1	1				3						1		9
Europe & Mediterranean		1												6		7
Europe & Africa														2		2
Southern Hemisphere		6	6									1				13
Northern Hemisphere		11	4					4				1		3		23
North America	4	5	5	3	1	1		3		1	2	2		26	3	49
United States	11	19	18	8	24	56	31	32	28	14	17	3	4	117		382
Eastern Coast US	2		2					1		1				31		38
Eastern Half US					2	1		1	1	1				38		44
Western Half US	3												4	11		18
Southern US	5	1				4		1	1	1		1		8	1	23
N.E. US	4	1	1	1	1	3		1	1	3	1			9	3	29
Mid-Atlantic States	4	3	1			1				1				1		11
N. Cent. US	1					1	1		1	1				1		7
S. Cent. US	2		1			1	1		2	2				3		12
W. Cent. US	6	1			1									2		10
Great Lakes Area		1						3	2					1		7
Rocky Mt. States	1		1				2		1		1					6
N.W. US	2													6		8
Pacific Coast States	2	1	2	1							1		1	1		7
Canada	4	3	2	1	1	1		2	1		2			4		22
Alaska	2	1	1	1					2							7
Mexico	3		1	2	1			1			1			4		13
US & Canada						2	3			1						6
US State Maps	1	1						2		1			10	11		26
N. Amer.-E. Half														4		4

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South America	10	6	8	6	3	7	3	7	1	2	6	1		5		65
Brazil			2			4		1			1					8
Argentina			2		1	1	1				1					6
S. Half SA	1							3			1					5
N. Half SA	1		1													2
Chile	1		1					1								3
Asia	5	4	2		1	2		2			2			3		21
Russia	4	7	4	1	1	2		3	4	2	1			2		31
India	2	2	2	3		4						1				14
China	3	2	4			2		1	1					1		14
Japan	2	1	1			1		1	1					4		11
Indo-China		1														1
Arabia		1														1
S.E. Asia	1	4	3	3		5		1						1		18
S.W. Asia	1	1							1							3
Africa	7	11	6	1		1		6			5					37
Egypt	1	1	4		1						1			3		11
Congo Basin			2													2
N. Africa								2								2
S. Africa									1							1
Europe	10	12	5	3	2	2	2	7	2		2			59		103
Regions	7	3	1					1	3	2				1		18
Scandinavia	6	5	1											1		13
Great Britain	2	3							1	4				1		11
Italy		2	1											5		8
Greece	2	1												7		10
France	1	1								2				5		9
Germany	1	1								1				2		5
Netherlands		1	1											2		4
Iberia	1	1	1													3
Switzerland			1		1											2
Poland														1		1

MAPS APPEARING IN CURRENT BRAILLE TEXTS IN GEOGRAPHY, SOCIAL STUDIES, HISTORY (49 texts)

	Political & Physical	Political	Physical	Rainfall	Population	Agriculture Crops	Agriculture Animals	Transportation & Trade Routes	Minerals	Manufacturing Commerce	Vegetation & Land Use	Climate	Irrigation Reclamation	Historical	Fishing	Total
Australasia	4	6	1		1			2						1		15
Australia	6	2		4	2			5	1		2					22
Phillipines	2							1								3
N. Zealand			1													1
Atlantic Ocean		4	5					2						13	1	25
Pacific Ocean	2	6	1					4						5	1	19
Arctic			1					2								3
Indian			1													1
TOTALS	159	240	145	51	62	150	55	146	70	40	53	45	19	509	15	1765
%	9	14	8	3	4	8	3	8	4	3	3	3	1	29	1	

TABLE II. MAPS AND GLOBES AVAILABLE FROM APH

	POLITICAL	PHYSICAL	POL-PHYS	TOTALS
World		1		1
N. America	1	1	1	3
S. America	1	1	1	3
Europe	1	1	1	3
Africa	1	1	1	3
Asia	1	1	1	3
Australasia		1	1	2
Arctic		1		1
US	1		2	3
	6	8	8	

Results:

Given in Table I are the frequency tabulations for the occurence of maps of different geographical areas and types of information in 49 Braille textbooks. The total number of maps utilized was 1,765. Represented were 74 geographical areas. Totals for each geographical area are given at the right of Table I. The ten areas occurring most frequently were United States (382), World (203), Europe (103), Western Hemisphere (71), South America (65), Eastern Hemisphere (57), North America (49), Eastern half of U.S. (44), Eastern Coast of U.S. (38), and Africa (37). These maps constituted 59% of the total. Totals and percents for type of information presented are given at the bottom of this table. The six types of information presented most frequently and their percents were historical (29%), political (14%), political-physical (9%), agriculture-crops (8%), transportation-trade routes (8%), and physical (8%). Table II gives the distribution by area and type of maps currently available from A.P.H.

(Insert Table I)

The disparity between the information required and that available is quite apparent. Of 74 geographical areas required, only 9 are available in Braille. Six of the 10 most frequently occurring areas are represented in current Braille maps. Braille maps fall only within three of 16 informational areas: Political, physical, and political-physical. Maps required in these informational areas constitute only 31% of the total. Braille maps do not fill this requirement entirely, since much less data is presented by them than on printed maps. A major informational category, historical maps, is not represented by Braille maps at all.

(Insert Table II)

Discussion:

The tabulations reveal the extent of information presented through maps in printed texts that ~~are~~ is not available to Braille readers. This discrepancy is most apparent for our own country and nations within this hemisphere. It would appear then that highest priority should be assigned to production of maps depicting these areas. Two problems must be considered before additional map production is undertaken. The first is the problem of map symbolism and the second, the problem of map size and scale.

In the past the number of symbols other than Braille used on maps has been restricted to two or three. This necessarily reduces the amount of information that can be conveyed by Braille maps. Production of more meaningful maps must await the development of a standardized tactual symbolism. Much information on this topic is already available from research on tactual coding of aircraft controls, and the work of Dr. John C. Sherman of the University of Washington on tactual map symbols for the blind. Until a proven tactual symbolism is available, the utility of Braille maps will remain at a relatively low level. Steps should be taken to insure that research in this area is vigorously pursued.

The problem of map size and scale should also be considered. Map size and scale are directly related in that for any geographical area, setting the limit on one also sets the limit on the other. Since there are practical limits to map size, it may be best to set limits on this dimension, and then adopt a series of map scales in ratio which will allow representations of areas to maximally occupy the map space. Relativity in map scales would also allow students to make comparative judgments of the sizes of land masses.

As indicated above, more maps of the United States and areas within the Western Hemisphere are depicted in currently available Braille books than of other areas. Therefore, it would seem reasonable to try to fill this gap first.

One approach might be to take each book and reproduce those maps required when possible. However, a more efficient approach might utilize frequency data similar to that in the present study to generalize a set of maps suitable for most purposes of all appropriate texts.

Vacuum forming of plastic appears to be a fruitful medium through which to increase the range and variety of available Braille maps. Using fairly heavy plastic, maps of necessary areas could be inexpensively molded through this process. These would be similar to the United States maps currently produced by A.P.H. An interesting alternate would use a heavy molded or carved flat political map as a base map. Accompanying this basic map would be a whole series of light plastic overlays, each furnishing a different type of information about the basic geographical structure.

APPENDIX A --- DEFINITIONS OF MAP CATEGORIES.

1. Political -- any map showing subdivisions of the total area portrayed -- i.e., a world map naming continents and/or countries or a continent map showing countries. Cities are usually indicated.

2. Physical -- any map showing physical characteristics of area portrayed -- i.e., topography of land masses or ocean currents.

3. Political-Physical -- a map showing some of both of the above features.

4. Rainfall -- a map showing differential amounts of precipitation among areas.

5. Population -- a map showing density of people per area or distribution of ethnic groups.

6. Agriculture-Crops -- a map showing location and/or amount of production from plant sources.

7. Agriculture-Animal -- a map showing location and/or amount of production from animal sources.

8. Transportation or Trade Routes -- a map showing avenues of physical communication or exchange of products.

9. Minerals -- a map showing sites and/or amounts of mineral substances produced.

10. Manufacturing-Commerce -- a map showing sites of manufacturing or commercial enterprises. May show amount of production or trade.

11. Vegetation-Land Use -- a map showing destribution of natural vegetation or uses for which areas are suitable.

12. Climate -- a map showing any climatic feature except rainfall.

13. Irrigation-Reclamation -- a map showing any project of this type to include flood control, hydro-electric production and forest preserves.

14. Historical -- a map giving any type data which describes past situations (usually prior to 1945.)

15. Fishing -- a map showing fishing grounds.

16. Military -- a historical map showing military campaigns, battle sites, etc.